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Defense Manpower Policy

THE Office of Defense Mobilization has issued a statement on the training and utilization of scientific and engineering manpower.[1] The statement is quoted verbatim below.

Preface

This policy has been recommended by the interagency Manpower Policy Committee, its Committee on Specialized Personnel, and the national Labor-Management Manpower Policy Committee of the Office of Defense Mobilization. It is issued for information and guidance to employers of scientists and engineers; to educational institutions and to professional associations; and assigns to Government agencies the responsibility for providing assistance and leadership in the fields of action required of them.

I. Statement of the Problem

The importance of scientists and engineers in the establishment of the strongest possible defense and, should war come, in insuring ultimate victory, is well established and widely recognized. Furthermore, there is no limit, in principle, to the advances which can be made in science and technology, practical limits being imposed largely by the limited number of individuals with training and ability along these lines. The problem, then, is to formulate national policies and to take actions consistent with these policies and with the principles of a voluntary manpower program in order to guarantee the most effective use of existing resources of scientific and technical personnel and to encourage the training of increasing numbers of additional scientists and engineers.

Throughout this document all references to scientists and engineers make no distinction between the sexes or between racial groups, it being understood that equality of opportunity to make maximum effective use of intellect and ability is a basic concept of democracy.

II. Discussion of the Problem

Basically, the national defense program consists of the following major elements:

1. Maintenance of armed forces at approximately 3.7 million.

2. Production of military equipment and material to supply an armed force of 3.7 million, to provide a reserve supply of key equipment sufficient to meet the first year's needs of full mobilization, and to assist other free nations to build up their military strength.

3. Expansion of specialized manpower and pro-

[1] *Federal Register* Document 52-9858. Filed, September 5, 1952.

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ductive capacity to support high levels of both military and civilian production.

4. Maintenance of a vigorous civilian economy for an increasing population.

This is a long-term program. Any substantial change in it within the foreseeable future will be by way of expansion. Consequently, the requirements for specialized manpower presented in this report are estimated minimum requirements.

One of the most far-reaching effects of the defense program is an acceleration of research and industrial technology. Likewise the development, operation and maintenance of modern scientific weapons has given greater emphasis to military technology. As a result, industrial and scientific development which normally would have been spread over a decade now must be telescoped into less than half that time. The realities of international relations indicate that intensive activity in the fields of engineering, science, and industrial development must be made a more important aspect of our continuing national security. This means an unprecedented and sustained demand for specialized manpower in a great variety of fields.

Of the approximately 60 million civilians currently employed only about 4 million are in the professions. Only 1 percent or 600,000 are employed in engineering and in the biological and physical sciences. On this numerically small but vitally important segment of our manpower depends in very large part our national security and future increases in our standard of living.

New discoveries and the development of new techniques of inquiry call for an increasing number of investigators and as each area of knowledge becomes more complex, increased specialization of individuals and longer periods of training are required.

The advance of scientific knowledge also results in an increasing degree of utilization of specialized personnel as technical discoveries are applied in industrial operations.

The number of workers per engineer in the basic commodity producing and transporting industries, for example, has decreased continuously from an approximate 250 in 1900 to about one-quarter of that in 1950.

These factors help to explain the fourfold growth of the professions in the last 50 years—from one million to four million. There has been an even more rapid expansion in the engineering and scientific fields, which have increased some 60 percent in the last decade alone and now total 600,000. The continually increasing complexity of the economy and the rapid growth of research activity make it necessary that this trend continue.

Despite the fact that very large numbers of young men and women have been trained in science and engineering since World War II, stringencies of engineers and scientists now exist in some fields and acute shortages are in immediate prospect. This situation has been caused in part by the increased demand resulting from the defense program with no corresponding decrease in non-defense programs and in part by the very small number of persons trained in these fields during World War II.

As the defense program develops, two highly significant facts with respect to specialized personnel stand out:

First, the demand is rising rapidly and will continue at a high level indefinitely.

Second, college enrollments show that the supply completing training is declining and will continue to decline through 1954, after which an upturn will occur in the number of engineering graduates.

These facts indicate that in the next few years it will be very difficult, or impossible, to obtain a supply of specialized personnel equal to the expanded demand. Vigorous and intelligent action in the utilization of specialized manpower in the armed forces and in civilian activities is required. Both military and civilian manpower policies should recognize that within the objectives of attaining maximum military strength and maintaining a vigorous civilian economy the achievement of an improved balance between the supply of and demand for specialized personnel is our most urgent manpower goal.

III. Purpose

The purpose of this policy is:

1. To focus attention on the problems created by the shortage of trained scientists and engineers in the attainment of maximum military strength while maintaining a healthy civilian economy and to enlist the support and assistance of the public, industry, educational institutions, and Government agencies in the solution of these problems.

2. To indicate actions which should be taken to provide scientific and engineering manpower to achieve necessary research and development and production goals for 1952 and for the years immediately ahead.

3. To provide an initial program to meet scientific and technical manpower requirements of a broadened

mobilization base, and to set forth the policy of the Federal Government and the responsibilities of Government agencies concerned with scientific and technical manpower problems.

IV. Policy

It is the policy of the Federal Government to take and to encourage the taking of action which will aid in achieving the following objectives:

A. To utilize most efficiently existing resources of scientific and technical skills in private industry, in the civil government, in the armed forces, and in educational institutions.

B. To develop increasingly reliable information regarding requirements and resources of scientists and engineers to meet both immediate and long-term national needs.

C. On the basis of needs indicated under B, to attract and train the additional number of able young men and women required for scientific and technical fields.

Industrial employers, educational administrators, scientists and engineers, as individuals, and professional associations of scientists and engineers, have an important responsibility to assist in achieving these objectives. In order that they may do their full part, it is recommended that the actions listed below be taken. In taking these actions all groups should direct their efforts toward furthering the objective of self-development by the individual to meet the national need for scientific and engineering manpower.

It is recognized that many of the activities recommended are already under way in individual industrial firms, educational institutions, professional organizations and in government, but they are listed here partly for the sake of completeness and partly for the purpose of bringing them to the attention of those segments of industry, education and the professions which are not now engaged in such activities.

a. Employers of scientists and engineers are urged:

1. To make every effort to meet increasing demands for engineering and scientific personnel by improving their utilization of scientists and engineers through programs of systematic review and reevaluation of the duties, responsibilities, training and experience requirements of positions in which scientists or engineers are employed to determine the minimum levels of training and experience required for each position. Particular attention should be given to identifying and utilizing scientists and engineers of exceptional ability in work which will make full use of their capacities.

2. To take the necessary steps to develop qualified research leaders and administrators.

3. To develop, in cooperation with educational institutions, especially the junior colleges and technical institutes, improved programs for selecting and training subprofessional personnel to do work which requires less than the full training of professional scientists and engineers.

4. To maintain programs for the continuous review of performance and compensation of scientists and engineers to assure that salaries are commensurate with the contributions being made by such personnel.

5. To consult with public employment offices in the development of recruitment campaigns to avoid activities which would be disruptive to high-urgency defense work. Professional associations and similar organizations may be of assistance in providing additional information needed in this connection. Large scale transfers of personnel between projects of equal urgency or from a project of greater urgency to one of lesser urgency are obviously contrary to the best interests of the mobilization effort.

6. To cooperate with educational institutions in the development of on-the-job or off-the-job training for scientists and engineers which will increase and broaden the professional competence of such personnel.

7. In the case of professional personnel subject to induction into the armed forces, to submit complete and timely employment information to local Selective Service boards for their use in classification of registrants engaged in essential activities of a scientific or technical nature.

8. In the case of professional personnel subject to recall to active duty by the Armed Forces, to submit complete and timely employment information to appropriate military authorities for their use in determining eligibility for delay in recall to active duty.

9. In cooperation with associations of employers in industries in which serious shortages of scientists and engineers exist, to establish Technical Manpower Utilization Committees to consider steps which can be taken on an industry-wide or area basis to alleviate the effects of those shortages and to disseminate in-

formation concerning successful practices of individual firms in dealing with such shortages.

10. In cooperation with associations of employers, to consider the advisability of expanding existing scholarship programs to assist students with the necessary ability and interest but without the necessary funds to complete their education in the sciences and in engineering.

11. To reexamine their personnel policies and effect any changes necessary to assure full utilization of women and members of minority groups having scientific and engineering training.

12. To cooperate with appropriate public and private agencies in determining current and long-range requirements and resources of scientists and engineers and in developing relevant information regarding their employment, such as salaries, hours, mobility, and working conditions. It is essential that employers of scientists and engineers take steps to improve the techniques for forecasting their own current and long-range technical manpower requirements.

b. Professional associations of scientists and engineers are urged:

1. To undertake informational programs designed to bring to the attention of students, through normal educational channels, and to individuals employed in sub-professional positions but possessing an aptitude for science or engineering, the career opportunities in scientific and technical fields in order to attract into these fields additional students with the required ability and interest.

2. To cooperate with appropriate public and private agencies in determining current and long-range requirements and resources of scientists and engineers and in developing relevant information regarding their employment, such as salaries, hours, mobility, and working conditions.

3. To cooperate with educational institutions in studying the adequacy of existing curricula in the sciences and in engineering, in developing better teaching methods and in achieving maximum utilization of teaching facilities in scientific and engineering fields.

c. Educational institutions are urged:

1. To make special provision for students who possess the necessary aptitude for engineering work but who lack the courses in science and mathematics prerequisite for admission to the engineering college either because of the inadequacy of high school offerings or because their interest in an engineering career was developed too late in the high school program. Such special provision should include a program for locating the potential candidates, encouraging them to apply for enrollment in colleges offering scientific and engineering courses, and special counseling to assist the candidate in working up a suitable curriculum. In most instances the candidate's initial shortcomings may be made up either by a lengthening of the normal curriculum or by intensification through additional work during summer vacation periods.

2. To make further studies of the engineering curriculum, as regards both its content and its length, and to give consideration to all possible measures which may be indicated under present conditions of engineering and scientific manpower shortages, such as acceleration, cooperative work-study arrangements, etc.

3. To make further studies of teaching methods employed in the sciences and engineering and of the use of teaching and research facilities in these fields in order to achieve the maximum educational return from existing staffs and facilities.

4. To study the causes of high drop-out rates among qualified students of engineering and science and to take steps toward minimizing the number of such drop-outs.

5. To strengthen high school curricula in order that more high school graduates will be eligible for entrance into engineering colleges and to establish closer working arrangements between colleges and universities and high schools to the end that both high school students and the faculty will become more aware of the opportunities in the engineering field.

V. Assignment of Responsibility

In order that the desired objectives can be achieved in accordance with the above-stated policy the assignments indicated below are made to the specified departments and agencies of Government. In listing these assignments, it is to be understood that they do not, in many cases, represent new assignments of responsibility, and that many of the activities referred to are already under way. A complete listing is given in order to indicate the total responsibility of Government departments and agencies in implementing national scientific and engineering manpower policies.

A. The Department of Labor shall:

1. In cooperation with the National Science Foundation, Bureau of the Census, Federal Security Agency and the Civil Service Commission strengthen its program of information on the supply of and demand for scientists and engineers in industry, education and government and provide this information to:

a. Private and public employers as a guide to planning of their recruitment and training activities.

b. Schools for the guidance of students in the choice of careers.

c. The Selective Service System as a guide to the deferment of registrants having scientific and engineering training and experience.

d. The Department of Defense as a guide to the postponement in call to active duty of reservists having scientific and engineering training and experience.

2. Through the federal-state system of public employment offices, expand its informational and placement service to scientists and engineers and to employers of such personnel.

3. Encourage and assist employers of scientists and engineers in maintaining realistic hiring specifications and in conducting appropriate recruitment programs.

4. Determine manpower shortages which can be met in whole or in part by short-term training programs designed to complete the professional training in engineering or science of individuals already employed by industry or to provide additional professional training to allow employed engineers and scientists to assume increased responsibilities; cooperate with the Federal Security Agency in the arranging of appropriate programs through the use of local training facilities.

5. Cooperate with the Selective Service System and the Department of Defense in relating military manpower procurement policies to civilian requirements for scientists and engineers.

6. Develop, with the cooperation of the Department of Defense, expanded counseling and placement programs to assist individuals being discharged from the Armed Forces in availing themselves of training and job opportunities in scientific and engineering fields.

7. Make available to employers information on techniques for improving the utilization of scientists and engineers.

B. The Selective Service System shall:

1. Continue to apply to scientists and engineers the policy formulated by Congress providing for classifying in a deferred class registrants whose activities are necessary to the maintenance of the national health, safety, or interest for as long a period as they continue to meet the criteria for such deferment.

2. Prepare semiannually, in cooperation with the Department of Labor and the Department of Defense, a report on the status of the student deferment program, indicating any recommended changes in the size or character of this program and the reasons therefor.

C. The Department of Defense shall:

1. Continue, through the Military Departments, to review all military jobs requiring scientific and engineering skills and take any additional steps necessary to assure that to the greatest possible degree, consistent with the missions of the Armed Services.

a. Military personnel having full scientific or engineering competence are assigned to military jobs requiring that level of competence, and

b. Military jobs requiring less than full scientific or engineering competence are filled by subprofessional personnel.

2. Continue program of maintaining an inventory of current military manpower requirements in scientific and engineering specialties as an aid to determination of over-all specialized manpower requirements, to recall of reserves and to assignment or transfer of military personnel.

3. Encourage the continued development within the Military Departments of central military personnel records to facilitate the identification of individuals with scientific and engineering competence as an aid to meeting specialized manpower requirements of the Armed Forces to greatest extent possible by full utilization of personnel already in the Armed Services.

4. Continue review of reserve policies and take any additional steps necessary to assure that reservists possessing scientific and engineering competence which is being fully utilized in defense or essential civilian activities are called to active duty only when (a) the military services have need of persons with such skills and the need of the military services for

these skills outweighs that of the defense-supporting or essential civilian economy, or (b) when the individual reservist possesses highly developed, essential military skills which cannot otherwise be obtained, (c) the individual reservist has a special obligation to serve, such as completion of military-financed training programs.

5. Continue collaboration with the Atomic Energy Commission and the National Advisory Committee for Aeronautics in a review of the total research and development programs of the three agencies, which together account for the great bulk of all research and development work performed by or sponsored by the Federal Government, with a view toward reducing the demands on the engineering and scientific manpower pool to the minimum level consistent with the national security.

D. The Civil Service Commission shall:

1. Encourage and assist agencies which employ scientists and engineers to evaluate periodically all technical positions to determine the minimum levels of training and experience required to satisfactorily perform the duties involved, and to utilize personnel having full scientific and engineering competence only in positions requiring such competence.

2. In cooperation with all departments and agencies which employ technical personnel, develop a program for identifying scientists and engineers in the government service who possess exceptional ability and wherever necessary assist in placing them in positions which will make full use of such ability.

3. Encourage and assist agencies in developing training programs which will broaden and improve the competence of scientists and engineers now in the government service. Such programs might make use, in a teaching capacity, of the professional personnel of the agencies concerned, or might be carried out in cooperation with a neighboring college or university.

4. Encourage and assist agencies in developing subprofessional personnel to perform jobs not requiring full professional competence in science or engineering.

E. The Atomic Energy Commission shall:

1. Continue collaboration with the Department of Defense and the National Advisory Committee for Aeronautics in a review of the total research and development programs of the three agencies, which together account for the great bulk of all research and development work performed by or sponsored by the Federal Government, with a view toward reducing the demands on the engineering and scientific manpower pool to the minimum level consistent with the national security.

F. The National Science Foundation shall:

1. Encourage basic research in the sciences and engineering in colleges and universities in order to stimulate the training of additional and better trained scientists and engineers.

2. Conduct follow-up studies on young graduate scientists and engineers to determine what occupational adjustments they are making in or outside the armed forces in order to assist in the development of Selective Service policy and policy on placement of such personnel within the Armed Forces.

G. The Federal Security Agency shall:

1. Encourage and assist engineering colleges to make special provision for students who possess the necessary aptitude for engineering work but who lack the courses in science and mathematics prerequisite to admission either because of the inadequacy of high school offerings or because their interest in an engineering career was developed too late in the high school program. Such special provision should include a program for locating the potential candidates, encouraging them to apply for enrollment in colleges offering scientific and engineering courses, and special counseling to assist the candidate in working up a suitable curriculum. In most instances the candidate's initial shortcomings may be made up either by a lengthening of the normal curriculum or by intensification through additional work during summer vacation periods.

2. Encourage and assist colleges and universities to develop undergraduate and graduate level training for scientific and engineering personnel currently employed but requiring additional training to broaden and improve their professional skills.

3. In cooperation with employers and Labor-Management Committees, encourage and assist colleges, universities, and vocational schools, in areas where shortages of engineers and scientists exist, in the establishment of short training courses to develop draftsmen, engineering aides and scientific aides to assist professional personnel in matters requiring less highly developed skills.

4. Assist secondary schools in developing more adequate curricula and better teaching methods in

order to provide students possessing the requisite aptitudes and interests with the fundamental education necessary for college work in science and engineering.

H. The National Advisory Committee for Aeronautics shall:

1. Continue collaboration with the Department of Defense and the Atomic Energy Commission in a review of the research and development programs of the three agencies, which together account for the great bulk of all research and development work performed by or sponsored by the Federal Government, with a view toward reducing the demands on the engineering and scientific manpower pool to the minimum level consistent with the national security.

VI. This policy shall take effect on September 6, 1952.

OFFICE OF DEFENSE MOBILIZATION,
JOHN R. STEELMAN,
Acting Director.

Cornell Physics Experiments by TV

CORNELL UNIVERSITY students are this fall getting some of their instruction in basic physics from the television screen. In the main lecture room, which has been outfitted for the project, experiments are televised from the instructor's desk to viewing screens visible from all corners of the room. In some cases the equipment permits demonstrations impossible by ordinary methods. Generally, the innovation gives students a better view of the experiments and instructors more opportunity to explain them. For example, the television set-up makes it easier to show "Brownian movement"—the jittering dance of tiny particles suspended in a fluid. This phenomenon is invisible to the naked eye. Ordinarily students would wait their turns at microscopes; now, with the television camera trained into one microscope, the image is magnified on the screens and visible to everyone. The department plans to use the TV method to explain such other physical phenomena as light interference, surface tension, and the behavior of high-energy particles in a cloud chamber.

A midget television camera is the key unit in the installation. Two 21-inch viewers are employed. The installation is a "closed circuit," with coaxial cable linking the camera and viewing screens.

Mailing HIGHER EDUCATION

FROM TIME TO TIME complaints have been received that copies of HIGHER EDUCATION are badly crumpled and in poor condition when they reach readers. It has seemed advisable, therefore, to try mailing the periodical flat and without a wrapper. It would be appreciated if readers would comment on the advantages or disadvantages in mailing the periodical without a wrapper. Please send comments to:

Editor, HIGHER EDUCATION
U. S. Office of Education
Washington 25, D. C.

Economic Education Workshops

MORE THAN 1,500 participants, most of them teachers, took part in 25 economic education workshops during the past summer. The 1 national and 24 regional workshops in 17 States and the Territory of Hawaii were sponsored by colleges, universities, and other educational agencies in cooperation with the Joint Council on Economic Education. Leaders in business, labor, agriculture, government, and civic organizations participated in planning the workshops and evaluating their effectiveness.

Lectures were given by leading economists and by representatives from business, labor, and government. The experts and curriculum specialists helped participants develop a variety of instructional materials. The materials, when published, will be made available to teachers on request.

A total of $250,000 was contributed by business and labor orgainzations and by local foundations for the support of the 1952 workshops. Sponsoring institutions also contributed facilities and staff services. The current program has evolved from a single workshop sponsored by New York University and the Committee for Economic Development in 1948. The Joint Council has promoted the program since that time.

The focus in the 1952 national workshop sponsored by New York University was on the improvement of economic education in teacher-education institutions. Leaders in the economic education movement stress the importance of reaching teachers at the pre-service as well as the in-service level.

New General Education Hall at Harvard

HARVARD COLLEGE'S Allston Burr Lecture Hall is especially designed for showing experiments in chemistry, physics and related fields to freshmen and sophomores who are not specializing in science. The building centers on two amphitheaters—one seating 377 students, the other 207. Each has a bank of seats looking down on demonstration tables, chalkboard, projection screen, and lecturer. Here scientists demonstrate key experiments, many of them historical. More detailed, quantitative experiments are demonstrated to groups of 30 to 40 students in 4 conference rooms.

The new building has an exhibition hall for displaying scientific models, geological specimens, and early scientific instruments. It also provides classroom space for General Education courses in the social sciences and the humanities.

Pay-As-You-Go Plan

THE Stevens Institute of Technology, Hoboken, N. J., is providing a "pay-as-you-go" plan for financing a college education. Interest in the plan appears to have been stimulated by the passage of the Veterans' Readjustment Assistance Act of 1952, under which monthly payments for tuition and other expenses are made direct to the veteran. Inasmuch as almost all colleges ask that bills be paid in advance, at the beginning of each semester, some of them are trying to find means of accommodating veterans who are not able to pay the advance out of savings. The pay-as-you-go plan offers one way to handle the situation.

The Stevens Plan enables students to pay for a full year's cost of tuition, books, laboratory fees, dormitory charges, and other school expenses in 12 monthly installments. Arrangements have been made with two banks in the metropolitan area to lend students these sums on their own or parents' signatures. The money is advanced to the institute, and the issuing bank is reimbursed by the student or parent. Loans may vary in amount according to individual needs.

The plan operates as follows: Any student or prospective student is eligible to apply for a loan under the plan. Applications are accepted by the business office of the institute, which handles all details. Students over 21 years of age may apply for loans in their own names; others must have parents or guardians sign applications. The rate of interest is 4 percent per annum. Payment is made in 12 equal monthly installments beginning 30 days after the date of the loan. To illustrate, in the case of a loan of $100, the student or parent signs a note for $104. This is repaid in 12 monthly installments of $8.67 each. The bank granting the loan sends the student or parent a coupon book showing the exact amount to be paid and the date each payment is due. Payments are made direct to the bank.

Teacherphone Experiment at Boston University [1]

THIS FALL, a young man and woman, both handicapped and confined to their respective homes, started studies with 2,100 freshmen at the University of Boston. The two new students will see their classrooms only a few times in their college careers during special visits to the university. All their "classroom" work will be done via "teacherphones," a device employed by the university in a pilot experiment with the New England Telephone and Telegraph Company to help physically handicapped, home-bound young people succeed in college through classroom-bedroom telephone hook-ups.

Both students will be able to hear in their homes the actual classes in operation at the university, and will be able to talk to the class and to each other with the "teacherphones" installed in their homes.

Boston University has awarded each student a $150 scholarship, and additional help has come to them from other agencies. Both students hope to go on into advanced studies at the university, one in journalism, the other in advertising. The young woman now has her own advertising agency in her home, which she rarely leaves because since birth she has had only partial use of her arms and legs. The young man conducts a magazine selling business from his home. Stricken with infantile paralysis at the age of five, he is limited to his bed and wheel chair, but has long wanted to do newspaper work.

Both students were given a battery of entrance tests and their examiner reported that "both are superior students, serious, conscientious and able."

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[1] See also "Invalid Student Earns Degrees by Teacherphone," HIGHER EDUCATION, December 15, 1951, p. 92.

Fixed Fees in Land-Grant Colleges and State Universities

By MAUDE FARR*

TUITION AND OTHER FEES have always ranked as one of the important sources of income among higher educational institutions. In 1950, student fees (excluding Federal payments for veterans fees) amounted to about 22 percent of the total educational and general income of all higher institutions. Among public institutions almost 11 percent of educational and general income was derived from this source, while in the privately controlled institutions about 36 percent of current income came from student tuition and fees. When Federal payments for veterans' education are added, the percentage of income from student fees increased to approximately 38 percent (23.9 in public institutions and 58.0 in private institutions).

Since World War II there has been a steady increase in the cost of providing higher education. Faculty salaries have increased; the cost of maintenance and operation of physical plant has risen; and expanded services of higher institutions in the form of increased extension activities, adult programs, and general service programs have tended further to force upward the cost of higher education.

The data which follow have been assembled through a study of the catalogs of 52 land-grant colleges and universities plus 19 State universities situated in those States which maintain separate land-grant institutions and State universities. The institutions covered include those for white students in the 17 States maintaining separate institutions for white and Negro students together with the other land-grant institutions and State universities in the Northern and Western States.

While it cannot be said that these data are representative of tuition increases among all higher educational institutions, they nevertheless provide some information on the general upward trend in student fees in those institutions enrolling approximately 25 percent of all college students.

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Methods of Reporting Fees by Institutions

Early in the review of the catalogs it became apparent that descriptions of fixed fees vary widely from institution to institution. Fourteen of those in the land-grant group were found to charge a single, all-inclusive fee. In other institutions as many as seven different fees were noted. A study of the available information indicated that, for the most part, the fees tended to cover fairly similar items (a general university fee or tuition charge together with fees for student activities, health, athletics, etc.) regardless of whether covered by an all-inclusive fee or by a series of smaller fees. Such extraneous fees as those for change of program, withdrawal, late registration, special examinations, and breakage, were excluded from the study.

Resident Fees

In 1951–52 the average resident student fee charged by the land-grant colleges was $198.86. The range was from $89 at the University of Alaska to $818 at the Massachusetts Institute of Technology. It should be borne in mind, in considering the overall average of this group, that several of the land-grant colleges, but for certain of their schools, are essentially privately controlled institutions. Massachusetts Institute of Technology is completely under private control. The higher fees charged by these institutions increase the average fee for the total group.

In the 19 State universities studies, the average resident student fee ranged from a low of $131 to a high of $310. The average for all institutions was $192.10.

Tables 1 and 2 compare the average fees observed in the current study with those found by Kirchner in 1946–47.[1]

While these two sets of data are not strictly com-

[1] "Fixed Fees in Land-Grant Colleges and Universities," by Earl L. Kirchner, Office of Education, HIGHER EDUCATION, Vol. IV, No. 9, January 1, 1948.

parable because of different methods of reporting and different numbers of institutions used, they nevertheless show a trend that would probably not be altered if identical procedures had been followed in both studies.

Table 1.—Average fee per resident student, 52 land-grant institutions, by Field: 1946–47 and 1951–52

Field	1946–47	1951–52	Percent increase
Agriculture	$120	$163	36.7
Arts and sciences	150	171	14.0
Business administration	159	179	12.6
Dentistry	280	353	26.1
Education	128	167	28.2
Engineering	153	190	24.1
Home economics	121	164	35.5
Law	150	192	28.0
Medicine	317	402	12.7
Pharmacy	160	190	18.8
Veterinary medicine	129	178	38.0

Nonresident Fees

Only four of the land-grant institutions do not charge out-of-state or nonresident fees. They are the Universities of Hawaii and Puerto Rico, Massachusetts Institute of Technology, and Cornell University (except in its schools of Agriculture, Home Economics, Veterinary Medicine, and Labor Relations).

Table 2.—Average fee per nonresident student, 52 land-grant institutions, by field: 1946–47 and 1951–52

Field	1946–47	1951–52	Percent increase
Agriculture	$277	$344	24.2
Arts and sciences	292	345	18.2
Business administration	310	345	11.3
Dentistry	415	534	28.7
Education	271	344	26.9
Engineering	297	361	21.5
Home economics	270	337	24.8
Law	314	375	19.4
Medicine	518	571	10.2
Pharmacy	285	384	34.7
Veterinary medicine	279	377	35.1

The additional fee charged to nonresidents ranges from $90 per school year to $300. In some Midwestern States fees are charged on a reciprocal basis. For example, the University of Missouri charges a tuition fee to students of certain neighboring States equivalent to the fee charged Missouri residents attending the neighboring State universities.

Table 3.—Average per fee resident and nonresident student, 19 State universities, by field: 1951–52

Field	Average fee	
	Resident	Nonresident
Arts and sciences	$158	$361
Business administration	158	364
Dentistry	269	490
Education	161	366
Engineering	165	377
Home economics	136	336
Law	195	395
Medicine	377	591
Pharmacy	177	369

The data on the 19 non-land-grant State institutions are provided to round out the picture rather than to compare the fees charged in these institutions with land-grant college fees. The narrower range in the extremes of the charges made by the State universities results in a lower average fee. While the average of the fees charged resident students runs somewhat lower than in the land-grant colleges, the average fee per resident student runs somewhat higher.

Graduate Liberal Arts Institute

A GRADUATE INSTITUTE of liberal arts, offering a program in the humanities leading to a doctor of philosophy degree, is being inaugurated this quarter at Emory University. Study will be built around a required basic course, "Freedom Versus Authority." Outside this course the student will cut across subject-matter lines to follow his special interest in several areas of research.

The object of the graduate institute is education of college teachers to meet the demands in teaching survey courses in the humanities and social studies. The doctoral dissertations, as well as the course of

study, will be tailored for the individual student and may touch on several fields. It has been announced that "the dissertation will demonstrate the student's ability to do creative work, rather than aim at novelty," the end product of the institute being "the student, whether he goes into teaching or research. Contribution to knowledge, the purpose of most research work on the doctor of philosophy level, will be of minor importance."

The required course, "Freedom Versus Authority," will take two-thirds of the student's time for the first 9 months. A number of works, drawn from the classical world, the late Middle Ages, and the modern world, will be used as a basis for seminar discussions led by a panel of institute faculty members. During these 9 months, and beyond, an interdepartmental program of other courses will be carried by the student, perhaps leading to research in English, history, philosophy, languages, Bible, psychology, classics, political science, or even business administration.

NEW PUBLICATIONS

Government Publications

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(2) *Free Publications: Request direct from the agency issuing them.*

From the Office of Education

The Education of Children of Migratory Agricultural Workers: Digest of Four Regional Conferences, May–June, 1952. Washington, D. C., 1952. 64 p. Proc.

The Forward Look: the Severely Retarded Child Goes to School, by Arthur S. Hill. Washington, D. C., U. S. Government Printing Office, 1952. Bulletin 1952, No. 11. 54 p. 20 cents.

The 6 R's. Washington, D. C., U. S. Government Printing Office, 1952. 24 p. 10 cents.

Statistics of State School Systems, 1949–50, by David T. Blose and William Jaracz. Washington, D. C., U. S. Government Printing Office, 1952. Biennial Survey of Education in the United States, 1948–50, Chapter 2. 115 p. 30 cents.

From Other Government Agencies

Housing and Home Finance Agency, Division of Community Facilities and Special Operations. *The College Housing Program:* The What and Why of Title IV, Housing Act of 1950. Washington, U. S. Government Printing Office, 1952. 8 p. Free.

Federal Security Agency, Public Health Service. *Health Manpower Source Book*, by Maryland Y. Pennell and Marion E. Altenderfer. Washington, D. C., U. S. Government Printing Office, 1952. Public Health Service Publication No. 263, Section I, May 1952. 70 p. 40 cents.

Department of State, U. S. National Commission for UNESCO. *Teaching About the United Nations in the Schools and Colleges of the United States in 1950 and 1951*, by the Office of Education, Federal Security Agency. Washington, D. C., U. S. Government Printing Office, 1952. Department of State Publication 4649. 29 p. 10 cents.

Non-Government Publications

Fifty Years of Educational Leadership: Report of the President of Simmons College. Simmons College Bulletin, Vol. 45, No. 12, Sept. 1952. 16 p.

The Indiana Nursing Survey, by Genevieve K. Bixler, Margene O. Faddis, and Roy W. Bixler. 302 Terminal Bldg., Indianapolis 4, Ind., Indiana State Nurses' Association, 1952. 70 p. Paper, $2.

Presents extensive data concerning nurses, nursing, and nursing education in Indiana; discusses the need for improvement, and shows how it can be made.

The Individual and Liberal Education. Minneapolis, Minn., University of Minnesota Press, 1952. Published for the Social Science Research Center of the Graduate School of the University. 102 p.

Essays in honor of John Black Johnston read at the dedication of Johnston Hall, University of Minnesota, April 19–21, 1951. Eleven statements on various aspects of liberal education.

1951 Proceedings, Association of University Evening Colleges, 165 p. Proc. Paper, $1.50. May be procured from Willis H. Reals, Dean, University College, Washington University, St. Louis 5, Mo.

Proceedings of the thirteenth annual meeting, held in Detroit, Mich., Nov. 13–15, 1951. Includes the papers and addresses and stenographic reports of discussions.

The Social Sciences at Mid-Century. Minneapolis, Minn., University of Minnesota Press, 1952. Published for the Social Science Research Center of the Graduate School of the University. 102 p.

Essays in honor of Guy Stanton Ford, read at the dedication of Ford Hall, University of Minnesota, April 19–21, 1951. An introduction and nine essays by ten authorities in the social sciences.

A Study of Urban Public School Adult Education Programs of the United States. Washington 6, D. C., National Education Association, Div. of Adult Education Service, 1952. 171 p. $1.

Report of the Cooperative Study of Public School Education in the United States. Reports a questionnaire study of adult education in urban public school systems, community self-studies of public school adult education, and a study of continuing education for adults in the public junior colleges. One of several studies being made under the auspices of the Fund for Adult Education.

Your Opportunity To Help Yourself—To Help Others, 1952–1953, Theodore S. Jones, *ed.* P. O. Box 41, Milton 87, Mass., Your Opportunity, 1952. 222 p. Paper, $3.95; cloth, $4.95.

An annual catalog of basic information about scholarships, fellowships, educational loans, awards, grants, prizes, contests, competitions, and similar items available in many fields of study. These "opportunities" are arranged alphabetically with generous cross references.

Engineers and Ivory Towers, by Hardy Cross. A collection of statements edited and arranged by Robert C. Goodpasture. New York, McGraw-Hill Book Co., Inc., 1952. 141 p. $3.

Reflects Professor Cross' opinions on the relationship of the engineer and engineering to science and the humanities; touches on a wide range of subjects, including education, graduate study, the application of standardization, and the responsibilities and obligations of engineers.

HIGHER EDUCATION

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The Teacher of Teachers: Frontiers of Theory and Practice in Teacher Education, by Harold Rugg. New York, Harper & Bros., 1952. 308 p. $4.

Describes the transition in the philosophy and methods of teacher education which began in the early 1920's. The thesis of the book is expressed in the last chapter on "The Case for Creative Imagination: Theory and Program." It is, "What, then, is demanded of us? Above all else that we give up our timidity and face the present crisis in educational statesmanship. We must take our stand among those who will undertake the creative *reconstruction* of American life. We must do it now, while there is time, and we must do it with full knowledge of the penalties of our leadership."

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